

WHAT IS CLAIMED IS:

1. An air conditioner for a vehicle having a passenger compartment, the air conditioner comprising:

a heat exchanger for performing a heat exchange with air;

a case accommodating the heat exchanger, for defining an air passage through which air flows into the passenger compartment, the case being provided with a defroster opening through which air flows toward an inner surface of a front windshield of the vehicle, a face opening through which air flows toward an upper side of the passenger compartment, and a foot opening through which air flows toward a lower side of the passenger compartment, at positions downstream from the heat exchanger; and

a mode selecting device for opening and closing the defroster opening, the face opening and the foot opening, the mode selecting device including first and second rotary doors, wherein:

each of the first and second rotary doors includes a rotation shaft, an outer peripheral door surface separated from a center axial line of the rotation shaft to a radial outside by a predetermined dimension, and two side plates connected to the rotation shaft and end portions of the outer peripheral door surface in an axial direction of the rotation shaft; and

one of the first and second rotary doors is disposed to open and close one of the defroster opening, the face opening and the foot opening, and the other one of the first and

second rotary doors is disposed to open and close the other two of the defroster opening, the face opening and the foot opening.

2. The air conditioner according to claim 1, wherein:

each of the first and second rotary doors is formed into a gate shape by the outer peripheral door surface and the two side plates to have an inner space of the gate shape, through which air after passing through the heat exchanger flows;

the defroster opening, the face opening and the foot opening are arranged outside of the gate shapes of the first and second rotary doors;

each of the first and second rotary doors is provided with a seal portion on peripheral end portions of the outer peripheral door surface and the two side plates;

the case has seal surfaces each of which is provided around each of the openings; and

the seal portion press-contacts the seal surface of the case so that a communication between the inner space of the gate shape and each of the openings is shut.

3. The air conditioner according to claim 2, wherein:

each of the side plates is formed substantially into a fan shape having a pivot; and

the rotation shaft is disposed to protrude outside of the side plates from the pivots of the side plates.

4. The air conditioner according to claim 2, wherein:

the rotation shaft is constructed with two shaft parts disposed at the pivots of the side plates and separated from each other in the axial direction; and

the shaft parts are disposed to protrude outside substantially in a direction perpendicular to the side plates.

5. The air conditioner according to claim 1, wherein the first and second rotary doors are disposed such that the outer peripheral door surface and the side plates of the second rotary door are arranged inside of the outer peripheral door surface and the side plates of the first rotary door.

6. The air conditioner according to claim 1, wherein:

the first rotary door is disposed to open and close the foot opening; and

the second rotary door is disposed to open and close the defroster opening and the face opening.

7. The air conditioner according to claim 6, wherein:

the case includes right and left side wall portions in a vehicle width direction; and

the foot opening is provided in both of the right and left side walls to opposite to the side plates of the first rotary door.

8. The air conditioner according to claim 1, wherein:

the first rotary door is disposed to open and close the face opening; and

the second rotary door is disposed to open and close the defroster opening and the foot opening.

9. The air conditioner according to claim 1, wherein:

the heat exchanger includes a heating heat exchanger for heating air;

the heating heat exchanger is disposed in the case to form a hot air passage through which air passes the heating heat exchanger, and a cold air passage through which air bypasses the heating heat exchanger;

the foot opening is provided to be near the cold air passage than the hot air passage; and

the air passage of the case is provided with a hot air bypass passage through which air in the hot air passage is branched into right and left sides of the cold air passage and is introduced into the foot opening.

10. The air conditioner according to claim 1, wherein each of the first and second rotary doors are disposed in the case such that the side plates are arranged at right and left side in a vehicle width direction.

11. An air conditioner for a vehicle having a passenger compartment, the air conditioner comprising:

a heat exchanger for performing a heat exchange with air;

a case accommodating the heat exchanger, for defining an air passage through which air flows into the passenger compartment, the case being provided with a defroster opening through which air flows toward an inner surface of a front windshield of the vehicle, a face opening through which air flows toward an upper side of the passenger compartment, and a foot opening through which air flows toward a lower side of the passenger compartment, at positions downstream from the heat exchanger; and

a mode selecting device for opening and closing the defroster opening, the face opening and the foot opening, the mode selecting device including first and second rotary doors, wherein:

each of the first and second rotary doors includes a rotation shaft, an outer peripheral door surface separated from a center axial line of the rotation shaft to a radial outside by a predetermined dimension, and two side plates connected to the rotation shaft and end portions of the outer peripheral door surface in an axial direction of the rotation shaft;

the first rotary door is disposed to open and close the foot opening, and the second rotary door is disposed to open and close the defroster opening and the face opening;

the face opening is partitioned into a center face opening portion through which air is blown toward a center upper side of the passenger compartment in a width direction of the vehicle, and a side face opening portion through which

air is blown toward a side upper side of the passenger compartment in the width direction; and

the second rotary door is disposed to maintain an open state of the side face opening portion even while closing the center face opening portion.

12. The air conditioner according to claim 11, wherein:

the second rotary door includes a seal portion disposed for fully closing the center face opening portion at a portion corresponding to the center face opening portion, and an air amount adjustment member disposed for adjusting an air amount blown from the side face opening portion at a position corresponding to the side face opening portion.

13. The air conditioner according to claim 11, wherein:

the second rotary door is disposed downstream of the first rotary door in an air flow direction in the case;

the first rotary door is disposed to open and close the foot opening and a communication port through which air flows into an inner space of the second rotary door; and

the air passage of the case is provided with a bypass passage portion through which an upstream portion of the first rotary door directly communicates with the side face opening portion.